3.4 AIR QUALITY

This section describes ambient air quality conditions at Ames Research Center. The ambient air quality in a given area depends on the quantities of pollutants emitted within the area, transport of pollutants to and from surrounding areas, local and regional meteorological conditions, and the surrounding topography of the air basin. Air quality is described by the concentration of various pollutants in the atmosphere. Units of concentration are generally expressed in parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$). The significance of a pollutant concentration is determined by comparing the concentration to an appropriate ambient air quality standard, which restricts allowable pollutant concentrations to protect public health and welfare while including a reasonable margin of safety to protect the more sensitive individuals in the population.

The project site is located within the San Francisco Bay Area Air Basin. The basin includes the counties of San Francisco, Santa Clara, San Mateo, Marin, Napa, Contra Costa, and Alameda, along with the southeast portion of Sonoma County and the southwest potion of Solano County. The local air quality regulatory agency responsible for the basin is the Bay Area Air Quality Management District (BAAQMD).

The following sections describe climatic and meteorological conditions in the project area, and summarize measured air pollutant concentrations representative of existing project conditions. The implications of federal, State, and local air quality regulations are also discussed.

A. Climate and Meteorological Conditions

The climate at Ames Research Center is characterized by warm dry summers and cool moist winters. The proximity of the San Francisco Bay and the Pacific Ocean has a moderating influence on the climate.

The major synoptic feature controlling the area's climate is a large high pressure system located in the eastern Pacific Ocean, known as the Pacific High. The strength and position of the Pacific High varies seasonally. It is at its strongest when it is located off the west coast of the United States during the summer. Large-scale atmospheric subsidence associated with the Pacific High produces an elevated temperature inversion along the West Coast. The base of this inversion is usually located from 300 to 1,000 meters (1,000 to 3,000 feet) above mean sea level, depending on the intensity of subsidence and the prevailing weather condition. Vertical mixing is often limited to the base of the inversion, trapping air pollutants in the lower atmosphere. Marine air trapped below the base of the inversion is often condensed into fog or stratus clouds by the cool Pacific Ocean. This condition is typical of the warmer months of the year from roughly May through October. Stratus clouds usually form offshore and move into the Bay Area during the evening hours. As the land warms the following morning, the clouds often dissipate, except in areas immediately adjacent to the coast. The stratus then redevelops and moves inland late in the day. Otherwise, clear skies and dry conditions prevail during summer.

As winter approaches, the Pacific High becomes weaker and shifts south, allowing pressure systems associated with the polar jet stream to affect the region. Low pressure systems produce periods of cloudiness, strong shifting winds, and precipitation. The number of days with precipitation can vary greatly from year to year, resulting in a wide range of annual precipitation totals. Precipitation is generally lowest along the coastline and Bay, with the highest amounts occurring along south and west facing slopes. Annual precipitation totals for Ames Research Center ranged from about 150 to 790 millimeters (mm) (6 to 31 inches) during the 1945 through 1993 period of record, with an annual average of 343 mm (13.5 inches).[1] About 90 percent of rainfall in the region occurs between November and April. High pressure systems in winter can produce cool stagnant conditions. Radiation fog and haze are common during extended winter periods where high pressure systems influence the weather.

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[1] National Oceanic and Atmospheric Administration, 1995.

The annual average high and low temperatures at Ames Research Center are 68 degrees Fahrenheit (F) and 10 degrees Centigrade (C) or 50 degrees F, respectively. In July, the average high and low temperatures are 25 degrees C and 13 degrees C (75 degrees F and 57 degrees F), respectively, while in January the average high and low temperatures are 13 degrees C and 6 degrees C (57 degrees F and 42 degrees F. Extreme high and low temperatures recorded during the 48-year period of record were 40 degrees C and -6 degrees C (105 degrees F and 21 degrees F, respectively.[2] Temperatures along the Bay are generally less extreme compared to inland locations, due to the moderating effect of the Pacific Ocean.

The proximity of the Eastern Pacific High and relatively lower pressure inland produces a prevailing west to northwest sea breeze along the central and northern California coast for most of the year. As this wind is channeled through the Golden Gate and other gaps, it branches off to the northeast and southeast, following the general orientation of the San Francisco Bay system. As a result, the wind prevails from the north-northwest in the South Bay region and Ames Research Center during daytime hours. Nocturnal winds and land breezes during the colder months of the year prevail from the south due to drainage out of the Santa Clara Valley.

During the fall and winter months, the Pacific High can combine with high pressure over the interior regions of the western United States (known as the Great Basin High) to produce extended periods of light winds and low-level temperature inversions. This condition frequently produces poor atmospheric mixing that results in degraded regional air quality. Ozone standards traditionally are exceeded when this condition occurs during the warmer months of the year.

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[2] NOAA, 1995.

B. Regulatory Background

This section describes federal, State and regional air quality standards.

1. Air Quality Standards

The Federal and California Clean Air Acts have established ambient air quality standards for different pollutants. National Ambient Air Quality Standards (NAAQS) were established by the federal Clean Air Act of 1970 (42 U.S.C. § 7401 *et seq.*, amended in 1977 and 1990) for six "criteria" pollutants. These criteria pollutants now include carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), particulate matter with a diameter less than 10 microns (PM_{10}), sulfur dioxide (SO_2), and lead (Pb). The air pollutants for which standards have been established are considered the most prevalent air pollutants known to be hazardous to human health. In 1997, EPA established an 8-hour standard for ozone and annual and 24-hour standards for very fine particulate matter ($PM_{2.5}$).

California established ambient air quality standards as early as 1969 through the California Clean Air Act. Pollutants regulated under the California Clean Air Act are similar to those regulated under the Federal Clean Air Act, but in many cases, California standards are more stringent. Federal and State air quality standards are shown in Table 3.4-1. Both the national and California ambient air quality standards have been adopted by the BAAQMD. The following sections briefly describe the six criteria air pollutants.

a. Ozone

Ground-level ozone is the principal component of smog. It is not directly emitted into the atmosphere, but is formed by the photochemical reaction of reactive organic gases and nitrogen oxides (known as ozone precursors) in the presence of sunlight. Ozone levels are highest during late spring through early summer when precursor emissions are high and meteorological conditions are favorable for the complex photochemical reactions to occur. Approximately

TABLE 3.4-1 **CALIFORNIA AND FEDERAL AMBIENT AIR QUALITY STANDARDS**

			NATIONAL STANDARDS[1]	
Pollutant	**Averaging Time**	**California Standards**	**Primary [2,3]**	**Secondary[2,4]**
Ozone	8-hour	–	0.08 ppm (176 ug/m^3)	–
	1-hour	0.09 ppm (180 ug/m^3)	0.12 ppm (235 ug/m^3)	Same as primary
Carbon Monoxide	8-Hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	–
	1-Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	–
Nitrogen Dioxide	Annual 1-Hour	–	0.053 ppm (100 ug/m^3)	Same as primary
Sulfur Dioxide	Annual	–	0.053 pm (80 ug/m^3)	Same as primary
	24-Hour	0.04 ppm (105 ug/m^3)	0.14 ppm (365 ug/m^3)	–
	3-Hour	–	–	0.5 ppm (1,300 ug/m^3)
	1-Hour	0.25 ppm (655 ug/m^3)	–	--
PM10	Annual	30 ug/m^3 (geometric mean)	50 ug/m^3 (arithmetic mean)	Same as primary
	24-Hour	50 ug/m^3	150 ug/m^3	Same as primary
PM2.5	Annual	–	15 ug/m^3	
	24-Hour	–	65 ug/m^3	
Lead	Calendar Quarter	–	1.5 ug/m^3	
	30-Day Average	1.5 ug/m^3	–	--

Notes:
1. Standards, other than for ozone and those based on annual averages, are not to be exceeded more than once a year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.
2. Concentrations are expressed first in units in which they were promulgated. Equivalent units given in parenthesis.
3. Primary Standards: The level of air quality necessary, with an adequate margin of safety to protect the public health. Each state must attain the primary standards no later than 3 years after that state's implementation plan is approved by the EPA.
4. Secondary Standards: The level of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

Source: Illingworth & Rodkin.

half of the reactive organic gas and nitrogen oxide emissions in the Bay Area are from motor vehicles. Adverse health effects of ground-level ozone include respiratory impairment and eye irritation. High ozone concentrations are also a potential problem to sensitive crops such as wine grapes.

b. Carbon Monoxide

Carbon monoxide is a non-reactive pollutant that is highly toxic, invisible, and odorless. It is formed by the incomplete combustion of fuels. The largest source of carbon monoxide emissions is motor vehicles. Wood stoves and fireplaces also contribute. Unlike ozone, carbon monoxide is directly emitted into the atmosphere. The highest carbon monoxide concentrations occur during the nighttime and early mornings in late fall and winter. Carbon monoxide levels are strongly influenced by meteorological factors such as wind speed and atmospheric stability. Adverse health effects of carbon monoxide include the impairment of oxygen transport in the bloodstream, increase of carboxyhemoglobin, aggravation of cardiovascular disease, impairment of central nervous system function, and fatigue, headache, confusion, and dizziness. Exposure to carbon monoxide can be fatal in the case of very high concentrations in enclosed places.

c. Nitrogen Dioxide

Nitrogen dioxide is a reddish-brown gas that is a by-product of combustion processes. Automobiles and industrial operations are the primary sources of nitrogen dioxides. Nitrogen dioxide contributes to ozone formation. Adverse health effects associated with exposure to high levels of nitrogen dioxide include the risk of acute and chronic respiratory illness.

d. Sulfur Dioxide

Sulfur dioxide is a colorless gas with a strong odor and potential to damage materials. It is produced by the combustion of sulfur-containing fuels such as oil and coal. Refineries and chemical plants are the primary sources of sulfur-dioxide emissions in the Bay Area. Adverse health effects associated with exposure to high levels of sulfur dioxide include aggravation of chronic obstructive lung disease and increased risk of acute and chronic respiratory illness.

e. Inhalable Particulate Matter

Inhalable particulate matter or PM_{10} (particulate matter 10 microns or less in diameter) and $PM_{2.5}$ (particulate matter 2.5 microns or less in diameter) refers to a wide variety of solid or liquid particles in the atmosphere. These include smoke, dust, aerosols, and metallic oxides. Some of these particulates are considered toxic. Although particulates are found naturally in the air, most particulate matter found in the Bay Area is emitted either directly or indirectly by motor vehicles, industry, construction, agricultural activities, and wind erosion of disturbed areas. Most $PM_{2.5}$ is comprised of combustion products (i.e., soot). Small particulate matter may be inhaled, and possibly lodge in and/or irritate the lungs. Exposure to small particulate matter can also increase the risk of chronic respiratory illness with long-term exposure and altered lung function in children.

f. Lead

Lead occurs in the atmosphere as particulate matter. It is primarily emitted by gasoline-powered motor vehicles. Because the use of lead in fuel has been virtually eliminated, lead levels in the Bay Area have dropped dramatically, and are well below the ambient standards.

g. Toxic Contaminants

Besides the six "criteria" air pollutants described above, there is another group of substances found in ambient air referred to as Toxic Air Contaminants. These contaminants tend to be localized and are found in relatively low concentrations in ambient air. However, they can result in adverse chronic health effects if exposure to low concentrations occurs for long periods of time. They are regulated at the local, State, and federal level.

2. Federal Air Quality Regulations

This section describes the Bay Area's compliance with NAAQS, and the conformity analysis process.

a. Compliance within NAAQS

If an area does not meet one of the NAAQS over a three year time period, the EPA designates it as a "nonattainment" area for that particular pollutant. The EPA requires states with nonattainment areas to prepare and submit air quality plans showing how the standards will be met in the future or, if they cannot be met, how they can show progress toward meeting the standards. These air quality plans are referred to as State Implementation Plans (SIP). Under severe cases, the EPA may impose a federal plan.

Prior to 1998, the Bay Area was a "moderate nonattainment" area for carbon monoxide due to localized exceedances of the national carbon monoxide standards in downtown San Jose and Vallejo. The carbon monoxide standards have not been exceeded since 1991. In 1998, EPA approved the San Francisco Bay Area Redesignation Request and Maintenance Plan for the National Carbon Monoxide Standard and reclassified it as a carbon monoxide "maintenance" area.

Prior to 1995, the San Francisco Bay Area air basin was classified by the EPA as a "moderate nonattainment" area for ozone, since some air pollutant monitors in the area routinely measure concentrations exceeding the national 1-hour ozone standard. In 1993, after three years of monitoring compliance with the 1-hour ozone standard, the Bay Area Air Quality Management District (BAAQMD) submitted the 1993 Ozone Maintenance Plan to the EPA to request the redesignation of the region to an ozone maintenance area. The plan included measures to maintain the attainment of the ozone NAAQS.

The EPA, in 1995, granted the request and classified the Bay Area as a "maintenance" area after the region had not violated the ozone standard for 5 years (1990 – 1994). However, violations of the national 1-hour ozone standards occurred during the summers of 1995 and 1996. As a result, in 1997 EPA revoked the region's clean air status and designated the area as an "unclassified nonattainment" area for ozone.

In response to the redesignation of the area to an ozone nonattainment area, the Bay Area co-lead agencies (BAAQMD, the Metropolitan Transportation Commission and the Association of Bay Area Governments) prepared and submitted the San Francisco Bay Area Ozone Attainment Plan or Ozone SIP to the California Air Resources Board (CARB). This plan, which was a revision to the 1993 Ozone Maintenance Plan, was submitted to EPA in 1999. The plan includes a compilation of existing and proposed plans and regulations that govern how the region complies with the federal Clean Air Act requirements. This plan was designed to show how the region would attain the federal ozone standard by the end of the 2000 ozone season (summer) and thereafter. EPA defines attainment of the national 1-hour ozone standard as when the Bay Area does not record an exceedance of the ozone standard more than three times in a year for three consecutive years. The Bay Area continued to violate the ozone NAAQS in 1998; therefore, attainment of the standard was not possible prior to 2000. In March 2001, EPA formerly announced that the region had not attained the 1-hour ozone standard and it would only partially approve the plan. As a result, a new Ozone Attainment Plan was developed and submitted to the California Air Resources Board and EPA. This plan is required to demonstrate attainment of the 1-hour ozone standard by 2006. Currently, EPA is working with the Bay Area co-lead agencies to resolve issues with the plan. Federal funding for transportation projects throughout the Bay Area is in jeopardy until an ozone attainment plan is approved by EPA.

For all pollutants other than ozone, the San Francisco Bay Area Air Basin is in attainment of the NAAQS. The Bay Area counties, including Santa Clara County, have not measured ambient air pollutant concentrations in excess of those allowed by the NAAQS.

b. Conformity Analysis

Section 176c of the 1990 Clean Air Act Amendments outlines the “conformity” provisions for federal projects. Federal actions are required to conform with the requirements of a SIP and must not jeopardize efforts for a region to achieve the NAAQS. Section 176c also assigns primary oversight responsibility for conformity assurance to the federal agency undertaking the project, not the

EPA, state, or local agency. For there to be conformity, federally- supported or funded activities must not (1) cause or contribute to any new air quality standard violation, (2) increase the frequency or severity of any existing standard violation, or (3) delay the timely attainment of any standard, interim emission reduction, or other SIP milestone aimed at bringing the region into attainment.

In 1993, the U.S. EPA issued conformity regulations (40 CFR Parts 51 and 93) that addressed transportation projects (Transportation Conformity) and conformity of all other non-transportation federal actions (General Conformity). The primary requirements of the transportation conformity rule are that implementation of transportation plans or programs cannot produce more emissions of pollutants than budgeted in the latest SIP.

The General Conformity regulations apply to a wide range of federal actions or approvals that would cause emissions of criteria air pollutants above specified levels to occur in locations designated as nonattainment or maintenance areas. Since the Bay Area is in nonattainment (nonclassified) for ozone and is a CO maintenance area, federal projects are subject to the General Conformity regulations if they generate emissions of ozone precursor pollutants (i.e., reactive organic compounds [ROG] and nitrogen oxides [NOx]) or carbon monoxide in excess of approximately 91,000 kilograms (100 tons) per year, or if the emissions are more than 10 percent of the nonattainment or maintenance area's emission inventory for the pollutant of concern.

Projects that are subject to the General Conformity regulations are required to mitigate or fully offset the emissions caused by the action, including both direct and indirect (e.g., traffic) emissions that the federal agency has some control over. The BAAQMD adopted and incorporated the Transportation and General Conformity regulations into the SIP in 1994.

3. California Air Quality Regulations

The California Clean Air Act of 1988, amended in 1992, outlines a program for areas in the state to attain the CAAQS by the earliest practical date. The

California Air Resources Board (CARB) is the State air pollution control agency. The California Clean Air Act set more stringent air quality standards for all of the pollutants covered under national standards. It also regulates levels of vinyl chloride, hydrogen sulfide, sulfates, and visibility-reducing particulates. If an area does not meet the CAAQS, the CARB designates the area as a nonattainment area. Based on the California standards, the Bay Area is a serious nonattainment area for ozone (since the area cannot forecast attainment of the State ozone standard in the foreseeable future). It is also a state nonattainment area for PM_{10}. The Bay Area has met the CAAQS for all other air pollutants. The CARB requires regions that do not meet the CAAQS for ozone to submit clean air plans that describe plans to attain the standard.

4. Regional Air Quality Regulations and Planning

Regional air quality is regulated by the BAAQMD. The BAAQMD regulates stationary sources (with respect to federal, State, and local regulations), monitors regional air pollutant levels (including measurement of toxic air contaminants), develops air quality control strategies and conducts public awareness programs. The BAAQMD has also developed CEQA guidelines that establish significance thresholds and provide guidance for evaluating potential air quality impacts of projects and plans.

The BAAQMD has prepared the Bay Area Clean Air Plan (CAP) to address the California Clean Air Act. This plan includes a comprehensive strategy to reduce emissions from stationary, area, and mobile sources and attain the stricter State air quality standard mandated by the California Clean Air Act. The Plan is designed to achieve a region-wide reduction of ozone precursor pollutants through the expeditious implementation of all feasible measures. Air quality plans are developed on a triennial basis, with the latest plan developed in 1997 (i.e., '97 CAP). The primary objective of the '97 CAP is to reduce ozone precursor pollutants through the implementation of all feasible control measures.

C. Existing Air Quality Conditions

Air quality is affected by the rate of pollutant emissions and by meteorological conditions such as wind speed, atmospheric stability, and mixing height, all of which affect the atmosphere's ability to mix and disperse pollutants. Long-term variations in air quality typically result from changes in air pollutant emissions, while short-term variations result from changes in atmospheric conditions.

1. San Francisco Bay Region

In general, the San Francisco Bay Area is considered one of the cleanest major metropolitan areas in the country with respect to air quality. The air pollutants of greatest concern in the South Bay Area are ground-level ozone and PM_{10}, because the San Francisco Bay region as a whole does not comply with air quality standards for either pollutant. As described above, the San Francisco Bay Area annually exceeds the California Ambient Air Quality Standard for 1-hour ozone and 24-hour average PM_{10} levels. Throughout the Bay Area, the national 1-hour ozone standard was exceeded at one or more stations from 0 to 8 days annually over the last 5 years, and the new 8-hour ozone standard was exceeded from 0 to 16 days annually. The number of days that, on an annual basis, exceeded the more stringent 1-hour State ozone standard at one or more stations in the Bay Area ranged from 8 to 34 days per year over the last five years. The NAAQS for PM_{10} is not exceeded anywhere in the Bay Area, but the more stringent State standard is routinely exceeded in the Bay Area, as well as most other parts of the State. No other air quality standards are exceeded in the Bay Area. As a result, the San Francisco Bay region is considered nonattainment for ground-level ozone at both the State and federal level, and nonattainment for PM_{10} at the State level only. The San Francisco Bay region currently complies with State and federal standards for all other air pollutants (e.g., carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead).

The BAAQMD monitors air pollutant levels continuously throughout the nine-county Bay Area Air Basin. The Mountain View monitoring station, which is closest to Ames Research Center, measures only ground-level ozone concentrations. The nearest multi-pollutant monitoring stations are in Redwood City, several kilometers to the north, and San Jose, several miles to the south. A summary of air quality monitoring data is shown in Table 3.4-2. The values in the table are the highest air pollutant levels measured at these stations over the past five years (1996-2000). The number of days that measured 7 days per year in Mountain View, while federal 1-hour ozone standards of 0.12 ppm were not exceeded. The new 8-hour standard concentrations exceeded the NAAQS or CAAQS are given in Table 3.4-3. State ozone and PM_{10} standards were exceeded on several days each year. The maximum 1-hour ozone levels exceed the State standards of 0.09 ppm on 1 to of 0.08 ppm was exceeded once in 1995 and once in 1999 at Mountain View. Other State and federal standards were not exceeded.

The BAAQMD operates a 17-station air toxics monitoring network throughout the Bay Area. The closest station to Ames Research Center is the Mountain View monitoring station. Two other nearby monitoring stations are located in Redwood City and San Jose. Compounds measured by the BAAQMD include benzene, 1,3-butadiene, carbon tetrachloride, chloroform, ethylene dibromide, ethylene dichloride, methyl tert buytl ether (MTBE), methylene chloride, perchloroethylene, toluene, 1,1,1,-Trichloroethane, trichloroethylene, and vinyl chloride. Since the ambient concentrations of these toxic air contaminants are very small, they are measured and reported as part per billion (ppb) on a volume basis. Table 3.4-4 contains a summary of the recently measured toxic air contaminant concentrations for each of the compounds at the Mountain View monitoring station in 1999, and the Redwood City and San Jose monitoring stations in 2000. Maximum, minimum, and mean concentrations are presented for each compound. Also included in Table 3.4-4 are the overall Bay Area monitoring results, which include the maximum of all measured concentrations from all stations, the minimum concentration measured, and the mean concentrations from all Bay Area monitoring stations.

TABLE 3.4-2 **AIR POLLUTANT CONCENTRATIONS NEAR AMES RESEARCH CENTER**

Pollutant	Standard	Station Location	1996	1997	1998	1999	2000	2001
PM_{10} (ug/m^3)	24-Hour	San Jose	76	78	92	114	76	77
		Redwood City	48	70	49	84	53	65
PM_{10} (ug/m^3)	Annual	San Jose	25	26	25	25	27	28
		Redwood City	21	24	25	29	21	22
CO (ppm)	8-Hour	San Jose	7.0	6.1	6.3	6.3	6.3	5.1
		Redwood City	3.6	4.2	4.1	3.8	4.4	3.9
Ozone (ppm)	1-Hour	Mountain View	0.11	0.11	0.10	0.11	–	-
		San Jose	0.11	0.09	0.15	0.11	0.07	0.11
		Redwood City	0.10	0.09	0.07	0.08	0.08	0.11
Ozone (ppm)	8-Hour	Mountain View	0.08	0.08	0.06	0.09	–	-
		San Jose	0.08	0.07	0.09	0.08	0.06	0.07
		Redwood City	0.07	0.07	0.05	0.06	0.06	0.06
Nitrogen Dioxide (ppm)	1-Hour	San Jose	0.11	0.12	0.08	0.13	0.11	0.11
		Redwood City	0.09	0.08	0.06	0.10	0.07	0.07
Nitrogen Dioxide (ppm)	Annual	San Jose	0.025	0.025	0.025	0.026	0.025	0.023
		Redwood City	0.020	0.018	0.018	0.019	0.018	0.016

Notes: ug/m^3 = micrograms per cubic meter
ppm = parts per million

Source: BAAQMD.

TABLE 3.4-3 **SUMMARY OF LOCAL AIR QUALITY EXCEEDANCES**

Pollutant	Standard	Station Location	1996	1997	1998	1999	2000	2001
Ozone	NAAQS	Mountain View	0	0	0	0	–	-
	1-Hour	San Jose	0	0	0	0	0	0
	(0.12 ppm)	Redwood City	0	0	0	0	0	0
		Bay Area	-	-	16	9	3	1
Ozone	NAAQS	Mountain View	0	0	0	1	–	-
	8-Hour	San Jose	0	0	1	0	0	0
	(0.08 ppm)	Redwood City	0	0	0	0	0	0
		Bay Area	8	0	8	9	4	7
Ozone	CAAQS	Mountain View	3	1	2	7	–	-
	1-Hour	San Jose	5	0	4	3	0	2
	(0.09 ppm)	Redwood City	1	0	0	0	0	1
		Bay Area	34	8	29	20	12	15
PM_{10}	NAAQS	San Jose	0	0	0	0	0	0
	24-Hour	Redwood City	0	0	0	0	0	0
	(150Fg/m^3)	Bay Area	0	0	0	0	0	0
PM_{10}	CAAQS	San Jose	2	3	3	5	7	4
	24-Hour	Redwood City	0	2	0	3	1	4
	(50Fg/m^3)	Bay Area	3	4	5	12	7	-
All Other	All Other	San Jose	0	0	0	0	0	0
(CO, NO_2,		Redwood City	0	0	0	0	0	0
Lead, SO_2)		Bay Area	0	0	0	0	0	0

Source: BAAQMD

As can be seen from Table 3.4-4, the maximum measured toxic air contaminant concentrations in Mountain View are all lower than highest Bay Area values. Overall, the mean toxic air contaminant concentrations in Mountain View are similar to the mean concentrations for the overall Bay Area. However, several of the highest concentrations measured in the Bay Area were measured in Redwood City (methylene chloride) and San Jose (benzene).

2. Ames Research Center

Operation of Ames Research Center currently generates air pollution emissions from aircraft operations and stationary sources. The largest source of emissions at Ames Research Center is vehicular traffic. Existing NASA operations prior to new baseline projects generate an average of approximately 24,000 vehicle trips per day. Table 3.4-5 summarizes emissions for Ames Research Center, Santa Clara County and the Bay Area.

The 1996 emissions inventory represents the most recent annual emissions inventory available for the region. As shown in Table 3.4-5, the largest contributors of NOx, CO, and ROG air pollutants in the region are mobile sources. The largest contributors to PM_{10} at NASA Ames Research Center are aircraft operations. In the region, area-wide sources are the largest contributors to PM_{10}.

TABLE 3.4-4 **SUMMARY OF RECENTLY MEASURED TOXIC AIR CONTAMINANT CONCENTRATIONS NEAR AMES RESEARCH CENTER (IN PPB)**

	Mountain View (1999)			Redwood City (2000)			San Jose (2000)			Bay Area (2000)		
Compound	**Max**	**Min**	**Mean**	**Max**	**Min**	**Mean**	**Max**	**Min**	**Mean**	**Max**	**Min**	**Mean**
Benzene	1.60	0.10	0.55	2.20	0.10	0.69	3.10	0.10	0.75	3.10	<0.10	0.46
1,3-Butadiene	0.80*	<0.30*	0.32*	1.00*	<0.30*	0.46*	1.00	0.02	0.19	NA	NA	0.17
Carbon Tetrachloride	0.12	0.09	0.10	0.12	0.08	0.10	0.12	0.09	0.10	0.16	<0.02	0.01
Chloroform	0.10	<0.02	0.02	0.07	<0.02	0.02	0.03	<0.02	0.01	0.13	0.08	0.10
Methyl Chloroform	0.11	0.05	0.07	0.62	0.05	0.11	0.13	0.05	0.07	NA	NA	NA
Ethylene Dibromide	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Ethylene Dichloride	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Methyl Tert Butyl Ether	2.00	<0.50	0.91	5.70	<0.50	1.36	5.20	0.50	1.27	5.70	<0.50	0.73
Methylene Chloride	1.40	<0.50	0.29	1.30	0.50	0.37	1.10	<0.50	0.33	8.00	<0.50	0.36
Perchloroethylene	0.22	0.03	0.09	0.22	0.01	0.06	0.42	0.01	0.09	3.20	<0.01	0.06
Toluene	3.20	0.40	1.30	7.20	0.40	2.46	8.20	0.50	1.86	14.3	<0.10	1.24
1,1,1-Trichloroethane	0.39*	0.05*	0.10*	0.44	0.12	0.21	0.16	0.07	0.10	4.42	<0.05	0.12
Trichloroethylene	0.10	<0.08	0.05	0.75	0.08	0.17	<0.08	<0.08	<0.08	0.75	<0.08	0.05
Vinyl Chloride	<0.03	<0.03	<0.29	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30

* Based on 1998 data since 1999 or 2000 data not available.

Source: BAAQMD, CARB.

Note: ppb = parts per billion.
NA = not available.

TABLE 3.4-5 **EXISTING AIR POLLUTANT EMISSIONS INVENTORY FOR 2000**

	Emissions in Metric Tons Per Day (Tons Per Day)			
Source	**ROG**	**NO_X**	**CO**	**PM_{10}**
Ames Research Center[1]				
Aircraft Operations[2]	0.04 (0.04)	0.06 (0.07)	0.44 (0.49)	0.18 (0.20)
Stationary Sources[2]	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)
Mobile Sources[3]	0.15 (0.17)	0.27 (0.30)	1.58 (1.74)	0.07 (0.08)
Total	0.20 (0.21)	0.34 (0.38)	2.03 (2.24)	0.26 (0.29)
Santa Clara County				
Stationary Sources	28.1 (31)	10.9 (12)	10.9 (12)	2.7 (3)
Area-Wide Sources	20.9 (23)	3.6 (4)	34.5 (38)	38.1 (42)
Mobile Sources	69.0 (76)	94.4 (104)	597 (657)	3.6 (4)
Other	< 1	< 1	0.91 (1)	< 1
Total	118 (130)	108.9 (120)	642 (708)	44.4 (49)
Bay Area[2]				
Stationary Sources	113.5 (125)	80.8 (89)	31.8 (35)	15.4 (17)
Area-Wide Sources	81.7 (90)	15.4 (17)	153.5 (169)	118.0 (130)
Mobile Sources	289.7 (319)	410 (452)	2,418 (2,663)	19.1 (21)
Other	< 1	< 1	5.4 (6)	0.9 (1)
Total	485 (534)	506 (558)	2,609 (2,873)	153 (169)

Notes:
1. Draft 1999 and 2010 Moffett Federal Airfield Operations Assumptions using BAAQMD inventory emissions factors.
2. California Air Resources Board - 2000 Estimated Annual Average Emissions.
3. MVEI7G emissions factors applied to 24,451 daily trips.

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